

Glenallan Stream Restoration Project

Public Meeting
October 24, 2017



DEPARTMENT OF
**ENVIRONMENTAL
PROTECTION**

MONTGOMERY COUNTY • MARYLAND

Introductions

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Water Resources Engineer, DEP

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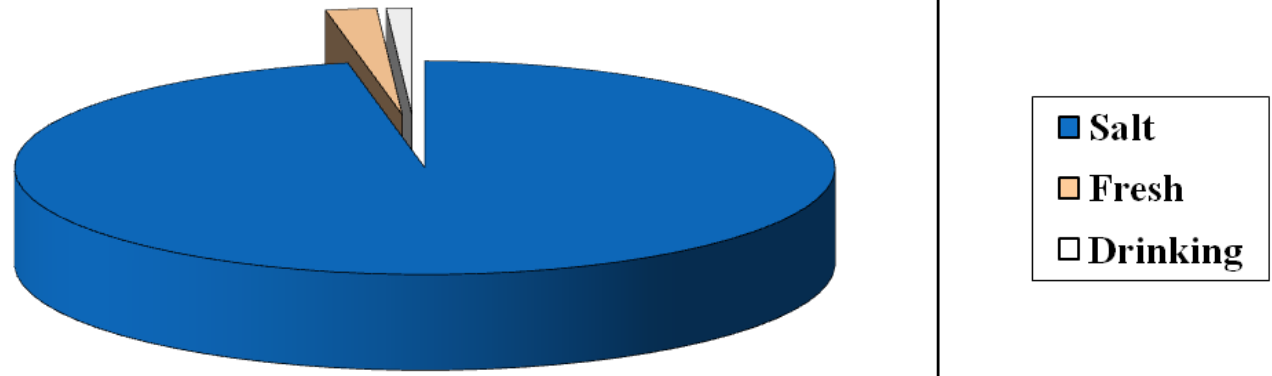
Bill Park

Project Manager, GPI

Today's Agenda

- Sources of Water on Earth
- Montgomery County background
- What is a Watershed?
- Intro to Runoff
- What the County is Doing to Protect Our Streams
- Glenallan Stream Restoration Project
- Questions/Comments

Sources of Water

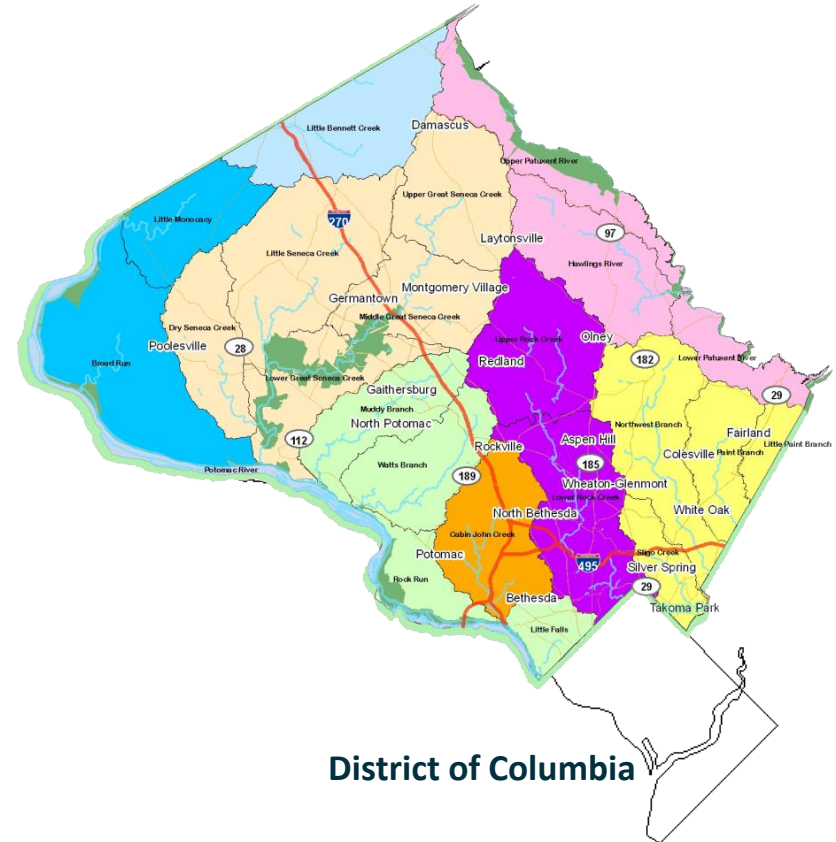


- About 97% is salt water
- About 2% is frozen
- Only 1% is available for drinking water
- Across the Country, most drinking water is from groundwater sources. In Maryland, most drinking water is from surface water

Potential for greater impacts from runoff in Maryland

Montgomery County, MD

- 500 sq. miles
- 1,000,000 people
 - Second only to Baltimore City within Maryland in average people per square mile
 - 184 languages spoken
- About 12% impervious surface overall
 - About the size of Washington DC
- Over 1,500 miles of streams
- Two major river basins:
 - Potomac
 - Patuxent
- Eight local *watersheds*



Impervious: Not allowing water to soak through the ground.

Watershed 101

- A ***watershed*** is an area from which the water above and below ground drains to the same place.
- Different scales of watersheds:
 - Chesapeake Bay
 - Eight local watersheds
 - Neighborhood (to a storm drain)

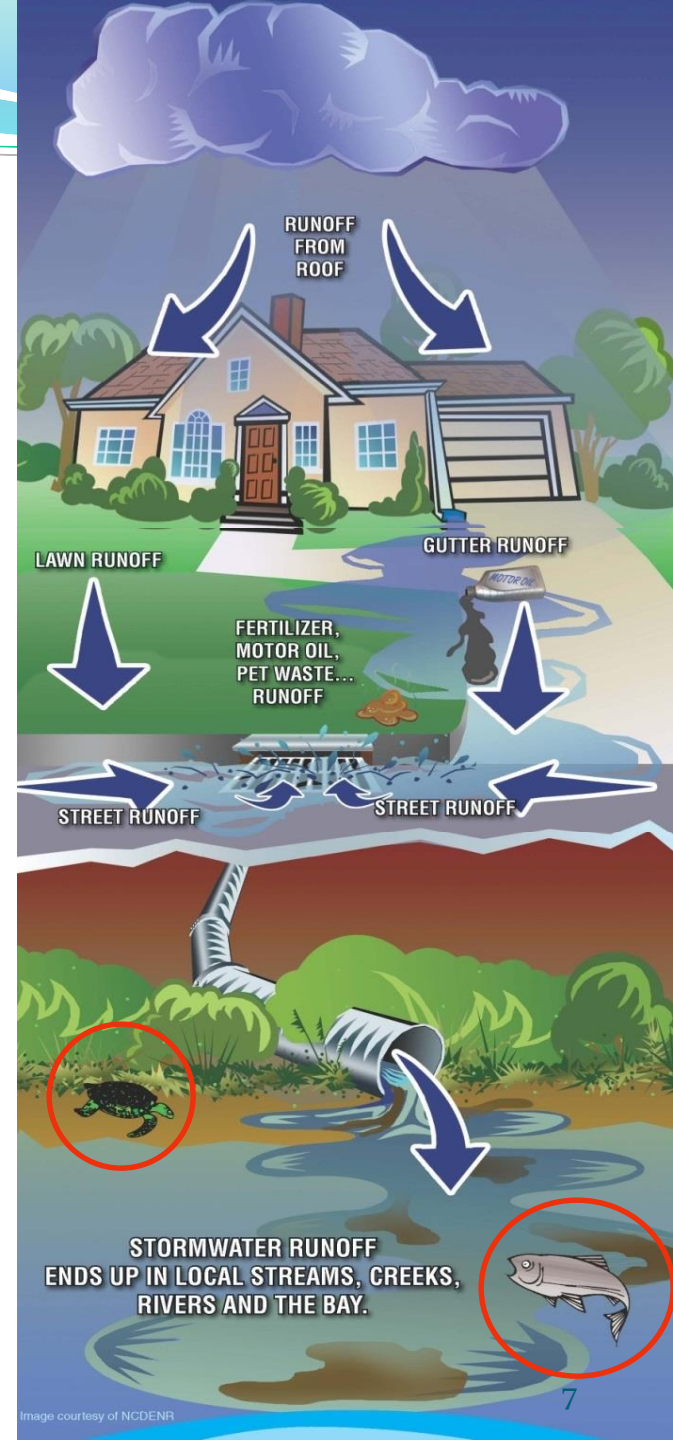


What is Runoff?

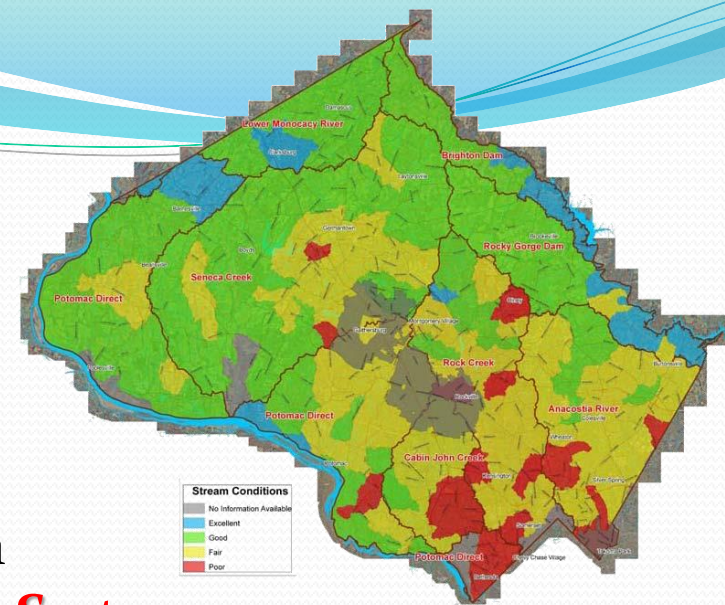
Water that does not soak into the ground becomes surface runoff. This runoff flows over hard surfaces like rooftops, driveways and parking lots collecting potential contaminants and flows:

- **Directly into streams**
- **Into storm drain pipes, eventually leading to streams**
- **Into stormwater management facilities, then streams**

Two Major Issues:
Volume/Timing of Runoff
Water Quality



What is the County doing to protect our Streams?

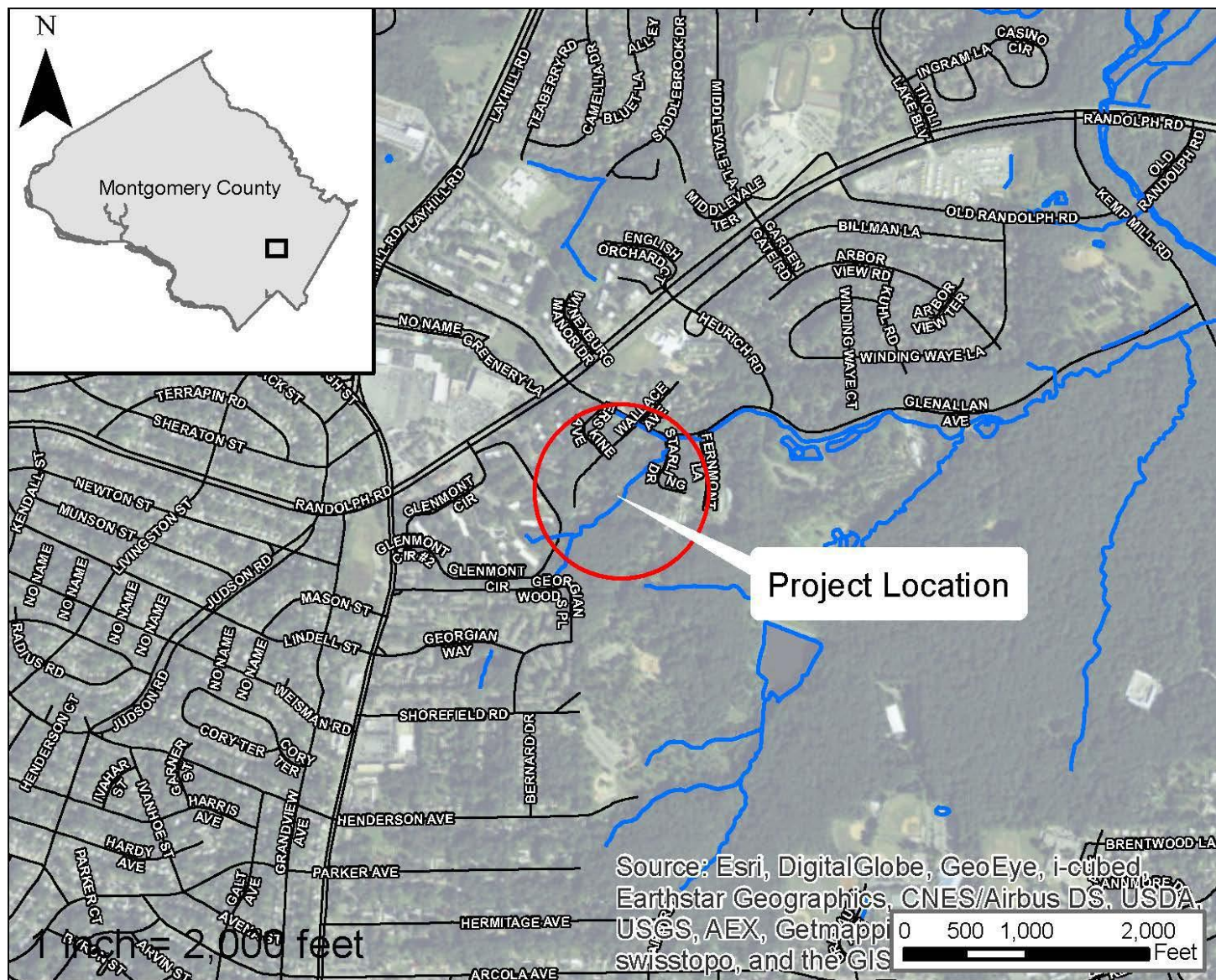


- Must meet regulatory requirements
 - Federal Clean Water Act permit program
 - **MS4 = Municipal Separate Storm Sewer System**
- Applies to all large and medium Maryland jurisdictions
- County programs
 - Restore our streams and watersheds
 - Add runoff management
 - Meet water quality protection goals
 - Reduce pollutants getting into our streams
 - Educate and engage all stakeholders
 - Individual actions make a difference
 - Focus on watersheds showing greatest impacts

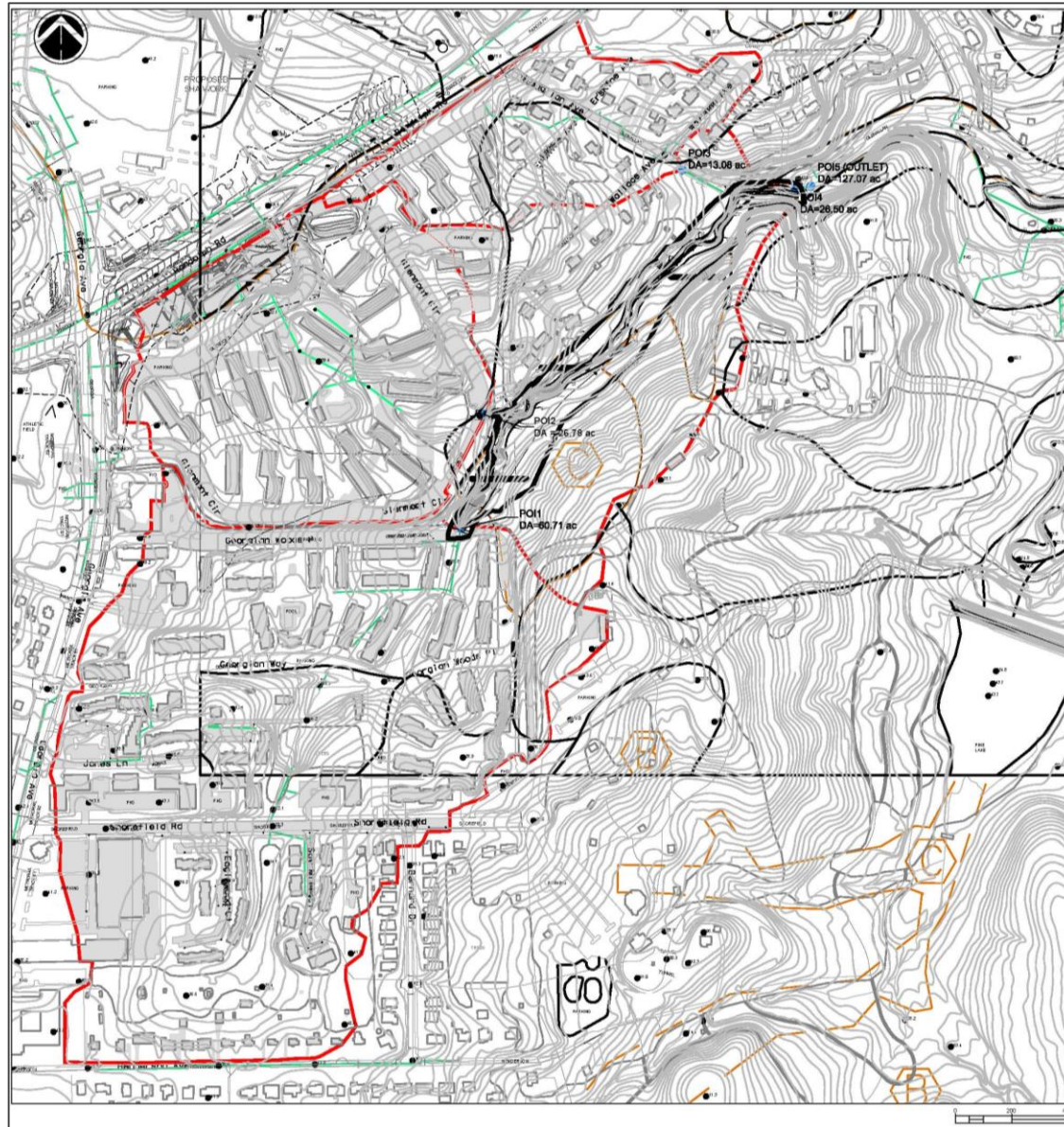
MS4 permit, what is it?

- Montgomery County is responsible for:
 - What goes into our storm drain pipes
 - What comes out of them
 - What flows into the streams
- Requires additional stormwater management for **20 percent** of uncontrolled impervious surfaces (3,778 acres)

Project Location



Drainage Area



Existing Conditions



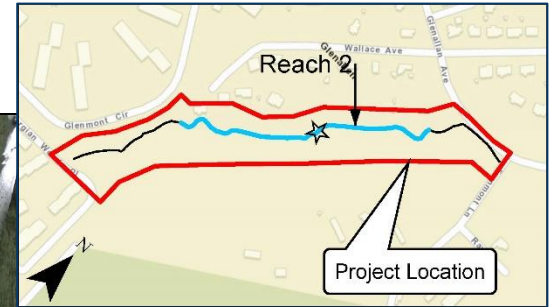
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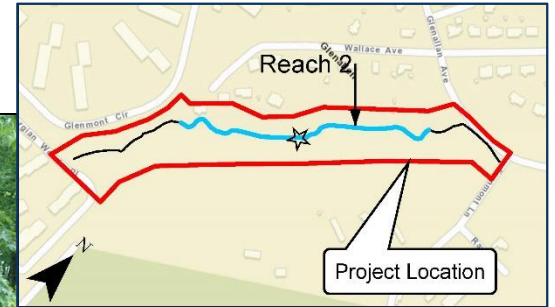
Existing Conditions



Existing Conditions



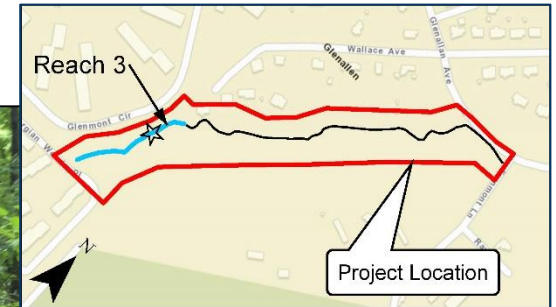
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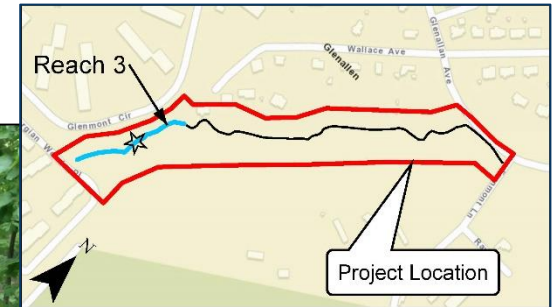
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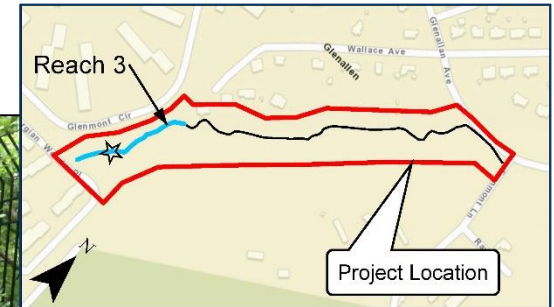
Existing Conditions



Existing Conditions



Existing Conditions



Goals of Stream Restoration

- Bed and bank stabilization
- Floodplain reconnection
- Water quality improvement
- Aquatic and riparian habitat improvement
- Flood flow attenuation improvement
- Minimize disturbance to existing mature trees
- Minimize risk of future property loss



Proposed Restoration

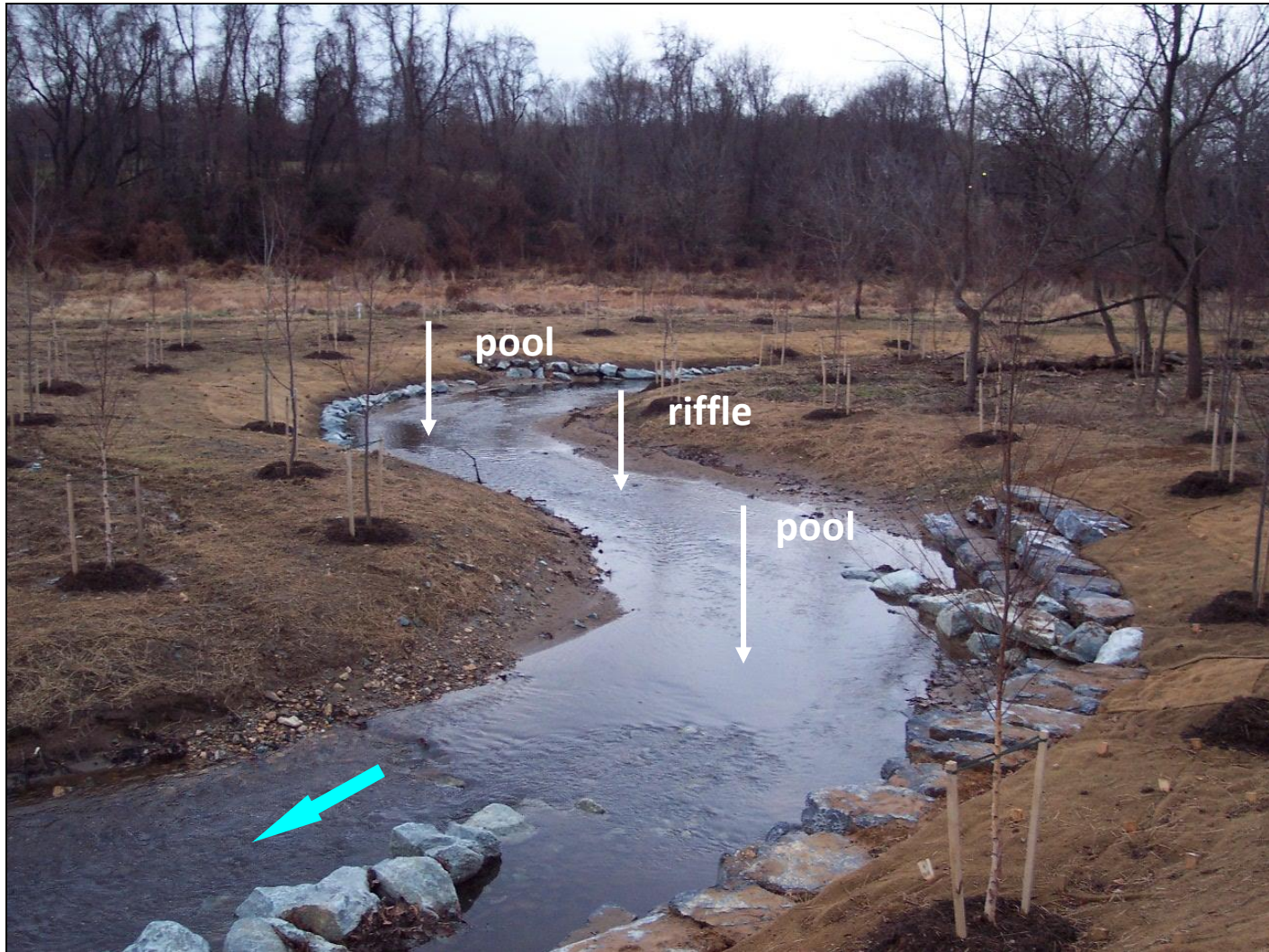


Riffle Habitat Feature



Glenora Tributary: Constructed Riffle

Riffle/Pool Sequence



Step Pool



Glenora Rockville, MD

Rock Cross Vane



Glen Echo, MD

Bank Roughness Feature



Norwood, MD

Rock Root Pack



Gaithersburg, MD

Construction Access (Example)



Typical Street Construction Access



Typical Forest Construction Access

Stream Restoration Example



Degraded urban coastal stream in Prince George's County, MD (2001)



Fully restored and stable for six years (2007) –

Erosion reduced 99%

Stream Restoration Example



Before Restoration

Immediately After Restoration



Glenora Stream Restoration
Montgomery County, MD

Stream Restoration Example

Before



During



After

Norwood, MD

Stream Restoration Approach

- Habitat enhancement
 - riffle/pool system
 - riparian cover – shading and avian habitat
 - diverse and native plant communities, floodplain forested wetlands
- Stabilization channel bed and banks
 - raising channel invert and minimizing bank height
- Increase floodplain function
 - reconnecting to floodplain
 - sediment and nutrient trapping
 - hydrologic retention
 - groundwater recharge

Stream Restoration - Reforestation

- Attractive, non-invasive native trees and shrubs will be planted along the entire stream corridor



Donnybrook Tributary: Riparian Planting 2014



Wilde Lake Reach D: Riparian Planting

Common Riparian Trees/Plants

Trees: Red Maple



Sycamore

Shrubs:

Buttonbush



Spicebush

Live stakes:



Black Willow



Silky Dogwood

Images Source: <http://plants.usda.gov>

Evaluating the Project Goals – Restoration Monitoring

- Perform County monitoring to evaluate whether project goals are achieved
 - Re-measure Stream Assessment cross sections & profile
 - Survey for Macro-invertebrates (aquatic insects) & Fish
 - Evaluate plantings for survival

Schedule

Glenallan Stream Restoration Project

- Public Meeting October 2017
- Final Design Spring 2018
- Permit Issued Fall 2018
- Construction Spring 2019

Questions/Comments?



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Click on “Stream Restoration”